(1) For each engine, an indicator to indicate thrust or to indicate a parameter that can be related to thrust, including a free air temperature indicator if needed for this purpose.

(2) For each engine, a position indicating means to indicate to the flight crew when the thrust reverser, if installed, is in the reverse thrust position.

(e) *For turbopropeller-powered airplanes.* In addition to the powerplant instruments required by paragraphs (a) and (c) of this section, the following powerplant instruments are required:

(1) A torque indicator for each engine.

(2) A position indicating means to indicate to the flight crew when the propeller blade angle is below the flight low pitch position, for each propeller, unless it can be shown that such occurrence is highly improbable.

[Doc. No. 26344, 58 FR 18975, Apr. 9, 1993; 58 FR 27060, May 6, 1993; Amdt. 23–51, 61 FR 5138, Feb. 9, 1996; Amdt. 23–52, 61 FR 13644, Mar. 27, 1996]

§ 23.1306 Electrical and electronic system lightning protection.

(a) Each electrical and electronic system that performs a function, for which failure would prevent the continued safe flight and landing of the airplane, must be designed and installed so that—

(1) The function is not adversely affected during and after the time the airplane is exposed to lightning; and

(2) The system automatically recovers normal operation of that function in a timely manner after the airplane is exposed to lightning.

(b) For airplanes approved for instrument flight rules operation, each electrical and electronic system that performs a function, for which failure would reduce the capability of the airplane or the ability of the flightcrew to respond to an adverse operating condition, must be designed and installed so that the function recovers normal operation in a timely manner after the airplane is exposed to lightning.

[Doc. No. FAA–2010–0224; 76 FR 33135, June 8, 2011]

§ 23.1307 Miscellaneous equipment.

The equipment necessary for an airplane to operate at the maximum operating altitude and in the kinds of operation and meteorological conditions for which certification is requested and is approved in accordance with § 23.1559 must be included in the type design.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964; 30 FR 258, Jan. 9, 1965, as amended by Amdt. 23–23, 43 FR 50593, Oct. 30, 1978; Amdt. 23–43, 58 FR 18976, Apr. 9, 1993; Amdt. 23–49, 61 FR 5168, Feb. 9, 1996]

§ 23.1308 High-intensity Radiated Fields (HIRF) Protection.

(a) Except as provided in paragraph (d) of this section, each electrical and electronic system that performs a function whose failure would prevent the continued safe flight and landing of the airplane must be designed and installed so that—

(1) The function is not adversely affected during and after the time the airplane is exposed to HIRF environment I, as described in appendix J to this part;

(2) The system automatically recovers normal operation of that function, in a timely manner, after the airplane is exposed to HIRF environment I, as described in appendix J to this part, unless the system's recovery conflicts with other operational or functional requirements of the system; and

(3) The system is not adversely affected during and after the time the airplane is exposed to HIRF environment II, as described in appendix J to this part.

(b) Each electrical and electronic system that performs a function whose failure would significantly reduce the capability of the airplane or the ability of the flightcrew to respond to an adverse operating condition must be designed and installed so the system is not adversely affected when the equipment providing the function is exposed to equipment HIRF test level 1 or 2, as described in appendix J to this part.

(c) Each electrical and electronic system that performs a function whose failure would reduce the capability of the airplane or the ability of the flightcrew to respond to an adverse operating condition must be designed and installed so the system is not adversely